

**INTERVENTION FOR EMOTION KNOWLEDGE AND  
BEHAVIOUR PROBLEMS IN CHILDREN WITH  
DEVELOPMENTAL DISABILITIES**

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## **ABSTRACT**

Children with impaired emotion knowledge are likely to also experience difficulties with social skills (Bukato, 2008) and internalising and externalising behaviour problems (Trentacosta & Fine, 2009, Fine et al, 2003). Given that children with developmental disabilities are both at risk of developing behaviour problems (Roberts & Lawton, 2001), and may have impairments in emotion knowledge (Wishart et al, 2007, Kasari et al, 2001, Sinzig et al, 2008; Bal et al, 2010), teaching emotion knowledge skills is likely to be beneficial in helping to ameliorate the risks faced by these children, for developing behaviour problems. The research question investigated in this study was; can using an adapted version of the PATHS programme with children and adolescents aged between 9 and 18, who have developmental disabilities, improve both their emotion knowledge and their behaviour problems? Four participants were recruited, aged between nine and 18 who had developmental disabilities, one of whom served as a pilot participant. The intervention was carried out in the participants' homes, with two one hour-long sessions a week. The measurements used included the Vineland-II, a behaviour diary and the Emotion Knowledge Test (EKT) - designed specifically for this research by the researcher. All participants included in the main study made improvements on the sentence-labelling task but not on the photograph-labelling task of the EKT. Participants 2 and 4 improved in regards to the number of problem behaviours displayed each week, Participant 3's problem behaviours did not occur often enough to determine whether improvements had been made. Participant 2 improved on both of the Socialisation and Maladaptive Behaviour domains of the Vineland-II, Participant 3 improved on the Socialisation domain and Participant 4 improved on the Maladaptive Behaviour Domain, however all improvements made were small. The results indicate that there may be promise with using the PATHS programme with children with developmental disabilities, in one-to-one settings. However this research involved several limitations, such as the reliability and sensitivity of the measures used and the short length of

the baseline and intervention periods. More research is needed in this area, as there are many possible social, emotional and academic benefits for these children, using the skills taught in the PATHS programme.

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# **CHAPTER 1**

## **INTRODUCTION**

Emotion knowledge involves skills such as recognising emotions in oneself and others, understanding emotions and regulating emotions (Denham, 1998). Acquiring these skills is important for children's social development (Bukato, 2008), and to prevent children developing internalising and externalising behaviour problems (Trentacosta & Fine, 2009; Izard, Mostow, Trentacosta, & Ackerman, 2003).

Research into the emotion knowledge of children with developmental disabilities has yielded somewhat mixed results. Delays in emotion knowledge have been found in children with Down Syndrome (Wishart, Cebula, Willis, & Pitcairn, 2007, Kasari, Freeman & Hughes, 2001), children with Autism (Sinzig, Morsch & Lehmkuhl, 2008; Bal, Harden, Lamb, Van Hecke, Denver & Porges, 2010) and children with ADHD (Sinzig et al 2008). Children with developmental disabilities also exhibit more behavioural problems than typically developing children (Roberts & Lawton 2001). It is unclear to why this is the case, however it may be that these children have more external risk factors present in their lives (Campbell, 1990) increasing the likelihood of behaviour problems, or it may be that the issue is more intrinsic to these children, and linked to individual factors such as their specific disability (Eisenhower, Baker, and Blacher, 2005), their cognitive level (Guralnick et al, 2003) or perhaps their level of emotion knowledge. Given that children with developmental disabilities are both at risk of developing behaviour problems, and may have impairments in emotional competence, teaching emotional knowledge skills is likely to be beneficial in helping to ameliorate the risks, faced by these children, for developing behaviour problems.



## **What is Emotion Knowledge and how does it develop?**

Terms such as ‘emotion knowledge’, ‘emotional competence’ and ‘emotional intelligence’ have all been used to describe a similar set of related skills. Denham (1998) suggests that emotional competence is made up of three inter-related skills; emotion expression and recognition, emotion understanding and emotion regulation. A term often used interchangeably with emotional competence is emotional intelligence, which has been said to be made up of skills such as knowing and managing one’s own emotions, motivating oneself, recognising emotions in others and handling relationships (Mayer, Salovey & Caruso, 2004). Goleman (1995) suggests that emotional intelligence is the ‘master aptitude’ as it affects all other abilities, either facilitating other abilities if a person has strong emotional intelligence skills, or hindering other abilities if a person has weak emotional intelligence.

From the first few weeks of life, a child is able to express a range of basic emotions such as happiness, sadness and anger, mainly through smiling and crying. After a few months, children are also able to recognise emotions in others through clues such as facial expression and tone of voice (Bukato, 2008). This is a skill that researchers and theorists agree is a necessary building block to more advanced emotion understanding (Denham, 1998, Hadwin, Baron-Cohen, Howlin, & Hill, 1996; Pons, Harris & Rosnay, 2004). When children are a few months old, the expression and recognition of emotions serve a communicative function between the caregiver and the child, where the caregiver learns of the child’s needs and the child learns what reaction their behaviours are likely to elicit from their caregiver. These skills lay the foundations for later, more complex social interaction (Bukato, 2008).

By the time children are two or three years of age, they have expanded the number of emotions that they are able to express, they have developed in the ways in which they can express them and the situations that elicit the different emotions will have changed (Buakto,

2008). Emotional development is closely tied to cognitive development at this age. When infants experience emotion it is mostly a physiological experience, as children grow and their cognitive skills develop, children begin to interpret the situations that elicit specific emotions; how a child interprets a situation will affect which emotion the child then feels (Denham, 1998). As children develop an understanding of their internal world as separate from that of the internal world of others (theory of mind) and also an understanding of the social rules around them, children will begin to experience more self-conscious emotions such as guilt, shame, embarrassment, empathy and pride (Denham, 1998; Bukato, 2008).

Children at around two or three years of age will start to communicate about their emotions verbally as their language skills develop. Moreover, preschool children are learning to regulate their emotions, an important skill to master as failure to do so puts children at risk for negative social and behavioural outcomes in the later school years (Bukato, 2008). The skills involved in expressing emotions, recognising them in others, and using them in social interactions all combine to form the ability of the child to regulate their emotions (Denham 1998).

Emotional competence is also closely linked to social development, as it is those around the child, such as their parents, siblings, peers and teachers, who will teach them about emotions. As children grow older, they participate in a growing number of social contexts, each with different people involved to teach them about emotions through such methods as modelling, coaching and contingency systems (Denham, 1998).

By middle childhood, children are mastering the emotional ‘display rules’ governing how and when to display emotions. Children learn to exaggerate, minimise, mask or even substitute the emotion that they are experiencing to fit the social situation that they are in (Elkman & Friesen, 1975, cited in Goleman, 1995). For example, a seven year old child who knows to smile and act happy when they are given a present that they do not actually like is

demonstrating that they have developed somewhat of an understanding of the social norms and expectations that surround the display of feelings (Bukato, 2008). As children continue to develop cognitively and are able to think in more complex, abstract terms, they begin to understand concepts such as how their thoughts are related to the way they feel, and that they are able to feel two emotions at the same time (Bukato, 2008).

During adolescence, children are mastering their ability to regulate their emotions, a skill that has significant social consequences. Those who are less able to manage the more negative emotions are more at risk of developing internal or external behaviour problems (Bukato 2008).

### **Emotion Knowledge, Behaviour Problems and Social Outcomes**

Emotion skills such as expressing and recognising emotions are the foundations for social skills (Buakto, 2008), the child who understands emotions better, is likely to have more positive relations with their peers (Denham, 1998). Goleman (1995) suggests that the development of social skills follows the approximate timeline; recognising emotions in the self, learning self control, attunement to other's feelings, then empathy develops, then handling emotions in others. These skills together are what people refer to as social skills and will determine how successful a person is relating to others. Bal et al (2010) assert that detecting and understanding emotions are key elements in social interactions as the skills together enable individuals to recognise the intentions of others and come up with appropriate responses.

Downs and Strand (2008) report that many studies have shown a correlation between adequate skills in emotion recognition and understanding and positive social behaviour. It has also been found that deficiencies in these skills have been related to more negative social outcomes and to internalising and externalising behaviour problems (Trentacosta & Fine,

2009, Fine et al, 2003, Cook, Greenberg, & Kusche, 1994, Denham, Caverly, Schmidt, Blair, DeMulder, Caal, Hamada & Mason, 2002, Kidwell, Young, Hinkle, Ratliff, Macrum & Martin, 2010). Trentacosta and Fine (2009) suggest that poor emotion knowledge may lead to an inability to manage and utilise emotions adaptively in social situations, which may then lead to dysregulated anger and frustration and acts of aggression in social situations. In regards to internalising behaviour problems, Fine et al (2003) found that emotion knowledge at seven years of age was significantly related to children's self-reports of internalising symptoms 4 years later, after controlling for per capita earned income, expressive vocabulary, and teacher-reported internalising and externalising behaviours at age seven. They suggest that difficulty with recognising and interpreting others' emotions when a child starts school may trigger a cycle in which unsuccessful social interactions lead to social alienation which results in the child feeling the emotions of guilt, shame, sadness and fear, which is likely to support further unsuccessful social exchanges in the future.

Cook et al (1994) also found a relationship between behaviour problems and lower levels of emotion understanding; it was also found that intellectual functioning attenuated the effect of behaviour problems on emotional understanding. Cook et al (1994) suggest that these results can be explained in a number of ways. It may be that some children with behaviour problems are actually less able to recognize emotion states in themselves and others or that these children are less willing to discuss their own emotional experiences with others. Depending on which of these theories is more accurate will have implications for intervention, whether teaching emotion recognition skills or providing a safe environment to encourage the discussion of emotions. Cook et al (1994) suggest that an intervention that includes both of these would be most beneficial. Interventions based on emotion knowledge are discussed further on in more detail.

## **Children with Developmental Disabilities and Behaviour Problems**

Children with developmental disabilities exhibit more behavioural problems than typically developing children (Roberts & Lawton 2001). Rutter, Tizard, Yule, Graham & Whitmore (1976) found that the prevalence of mild and severe behaviour problems was three to four times more likely in children aged 5 to 15 years with developmental disabilities than in typically developing children. In a review of the literature, Roberts et al (2003) found that the prevalence of behaviour problems in children with developmental disabilities varies from 20% in parent surveys of particular behaviour problems to 64% of young children with severe intellectual disability displaying challenging behaviours.

Researchers have attempted to give reasons as to why children with developmental disabilities are more likely to display problem behaviours than children without developmental disabilities. It may be that these children have more risk factors such as stressful life events within the family, single parents (Mitchell & Hauser-Cram, 2009), fewer economic resources (Dwyer, Nicholson, & Battistutta, 2003, McLeod & Shanahan, 1996, Shaw, Vondra, Hommerding, Keenan, & Dunn, 1994) disrupted, inharmonious relationships (McHale & Rasmussen, 1998) and higher levels of parenting stress (Baker, McIntyre, Blacher, Crnic, Edelbrock & Low, 2003) present in their family lives (Campbell et al 1998). Alternatively, the issue may be more intrinsic to the individual child. Eisenhower et al (2005) explain that there are syndrome-specific behaviour problems, for example children with Autism and Cerebral Palsy have been found to have more and different kinds of behaviour problems than children with Down syndrome. Guralnick et al (2003) suggest that children's level of cognitive functioning is related to their behavioural difficulties. Another possibility is that the child's level of emotion knowledge is related to behaviour problems as has been

shown by Trentacosta and Fine (2009), and Fine et al (2003). This possibility is elaborated on below.

### **Children with Developmental Disabilities and Emotion Knowledge**

Emotional competence is related to many other areas of development such as motor skills, cognition and language (Denham 1998), therefore it would be reasonable to expect that emotional competence be lower in children who have delays or impairments in these areas. Research into emotional competence in children with developmental disabilities has found deficits in emotional competence in children with Down syndrome (Wishart et al, 2007, Kasari et al 2001), children with Autism (Sinzig et al, 2008; Bal et al, 2010) and children with ADHD (Sinzig et al 2008). There have been a number of studies conducted which have yielded a mixture of results, and researchers have provided many different explanations of their results.

#### *Emotion knowledge in children with Down Syndrome*

Wishart et al (2007) investigated whether there were syndrome specific deficits in emotion recognition between children with Down syndrome, Fragile X syndrome and non-specific intellectual disability using an emotion matching task and a control identity matching task. There were no differences across groups on the identity matching task. The children with Down syndrome were the only group who performed significantly worse on the emotion matching task than the typically developing children. These children seemed to have particular difficulty with recognising the fear emotion.

Kasari et al (2001) hypothesised that because children with Down syndrome focus on other's faces more often, they may gain valuable information about emotions which may mean that these children have better social-emotional abilities relative to other children with intellectual disabilities. However, they found that three year old children with Down

syndrome performed equally as well on an emotion recognition task as their mental age peers, but did worse than their chronological age peers. Kasari et al (2001) suggest that emotion recognition abilities for young children with Down syndrome are more closely tied to developmental abilities than to their experiences observing emotions in others.

### *Emotion knowledge in children with Autism*

Impairments in emotion knowledge when children are young can predict how socially competent that child will be later on (Denham, 1998). As one of the main impairments in children with Autism is social competence there has been much research focused on emotion recognition in children with Autism. This research however has generated mixed results (Bal et al, 2010). Tracey, Robins, Schriber & Solomon (2011) found that a sample of children and adolescents with Autistic Spectrum Disorders (11 with Autistic Disorder, 15 with Asperger's, and two with Pervasive Developmental Disorder –NOS) performed equally well on a time-limited emotion recognition task as typically developing children. The children with ASDs were equally accurate even when exposure and response times were short, were equally fast when instructed to respond as quickly as possible; and were equally fast and accurate at recognizing the complex social emotions of pride and contempt, not just the basic emotions of happiness, sadness, anger surprise, fear and disgust.

Contrastingly, Bal et al (2010) found that a sample of children aged between seven and 17 diagnosed with Autistic Spectrum Disorder (ASD) or PDD-NOS made more errors in recognizing anger and were consistently slower across all emotions than typically developing children. They also found that these children had less regulated autonomic systems, and directed their gaze less towards the eyes of the stimulus picture, findings which may, in part explain the deficits in emotion recognition. Interestingly, the ASD children were no different from the typically developing children in their ability to recognise fear.

Downs and Smith (2004) found that a group of children with high functioning Autism performed no differently than a group of typically developing children and outperformed a group of children with Attention Deficit Hyperactivity Disorder (ADHD) and Oppositional Defiant Disorder (ODD) on social measures such as cooperative behaviour and aloof behaviour. The children with high functioning Autism did worse than both other groups on emotion recognition from photographs of facial expressions, although they were no different from typically developing children and did better than children with ADHD and ODD on tasks that involved emotion recognition from schematic drawings and that required them to identify situation, desire and belief based emotions. Downs and Smith (2004) hypothesise that these differences are due to children with Autism having a specific deficit in the visual processing of facial expressions interfering with their ability to recognise emotion states from facial expressions alone.

Bal et al (2010) suggest some reasons for the differences in findings between studies; different researchers use different experimental stimuli (photos or videos), and different selections of emotions (basic emotions or including complex emotions such as contempt, shame and pride). Moreover, a broad range of symptoms is included in the criteria of 'Autism', therefore the participants are likely to have different levels of functioning, the diagnosis of Autism may not always be confirmed and groups of participants are not always matched on intellectual functioning. For example, Tracey et al (2011) used a sample that included children with Autism, Aspergers and PDD-NOS and Bal et al (2010) used a sample that included children with Autistic Spectrum Disorder and PDD-NOS. These samples may have included children with a different range of intellectual or adaptive functioning but no attempt was made to control for this.

In contrast to the behaviourally based emotion recognition assessments described above, nearly all eye-tracking, neuroimaging, and electrophysiological studies have reported



deficits in emotion recognition in individuals with Autistic Spectrum Disorders (Harms, Martin & Wallace, 2010). The core brain regions that are involved in facial emotion processing include the inferior occipital gyri, the fusiform gyrus (FG), the posterior superior temporal sulcus (STS) (Haxby, Hoffman, & Gobbini, 2000) and the amygdala (Harms et al, 2010). In a recent review of the literature, Harms et al (2010) reported that during facial emotion recognition tasks, individuals with ASD are likely to have decreased activation of some parts of the brain such as the FG and the amygdala and increased activation in other areas such as the STS and anterior cingulate cortex (ACC) as compared to typically developing individuals. Moreover, Harms et al (2010) found differences such as abnormal connectivity between regions. Harms et al (2010) reported that together, these results suggest that individuals with ASD have difficulty processing facial expressions due to altered communication between brain regions rather than dysfunction of one region alone. In the same review, Harms et al (2010) also reported that eye-tracking studies commonly show that individuals with ASD process emotional faces differently to typically developing controls, focusing on the outer and lower parts of the face rather than the eyes.

Harms et al (2010) conclude that these eye tracking and neuroimaging studies provide evidence that children with Autism have deficits in emotion knowledge, and that behaviour based studies are not always able to pick up on this deficit due to the limitations of this type of study discussed earlier.

#### *Emotion knowledge in children with ADHD*

Children with ADHD have also been found to have impaired emotion knowledge (Sinzig et al, 2008; Downs & Smith, 2004; Da Fonseca, Segnier, Santos, Poinso & Deruelle, 2009). Sinzig et al (2008) found that children with ADHD performed poorer on a facial expression recognition task than did children with Autism and typically developing children. Children with Autism also performed poorer on the task than typically developing children

and children with both Autism and ADHD performed worse than any other group on the task. As mentioned earlier, Downs and Smith (2004) found that children with ADHD and ODD demonstrated worse emotional understanding than children with Autism and typically developing children. Furthermore, Da Fonseca et al (2009) found that children with ADHD were less accurate than typically developing children at identifying facial expressions of emotion and performed worse in tasks where children needed to use contextual information to understand emotion.

Yuill and Lyon (2007) noted the impairment in emotion recognition that has been found in children with ADHD and looked to see whether this impairment was due to an actual difficulty with social information processing or whether it was due to a more general cognitive deficit such as inattention and impulsivity when responding to emotion recognition tasks. They found that the children with ADHD performed more poorly on both emotion recognition and non-emotion tasks than typically developing children. To see whether this difference was due to impairment in social processing, Yuill and Lyon (2007) altered the task to provide a form of scaffolding, which discouraged impulsive responding. With this procedure in place, the children with ADHD performed better on both emotion and non-emotion tasks, however improvements were made more so in the non-emotion task. This suggests that while the scaffolding procedure helped decrease impulsiveness during responding, there was still a deficit in emotion recognition as compared to typically developing children. It seems that children with ADHD have a difficulty in emotion recognition that is not only due to general cognitive limitations but also due to impairment in emotion understanding.

Williams et al (2008) provide evidence of this impairment by recording brain function using event-related –potentials during an emotion recognition task. It was found that children with ADHD were less able to recognize emotional expressions than typically developing

control children, and disruptions to ERPs in the occipitotemporal brain systems. In particular there was a reduction in the right and left temporo-occipital regions indicating difficulty early on in the perception of the emotion expression. This means that these children may not be receiving important early indicators that give them clues as to what the emotion is that they are looking at (Williams et al 2008).

### **Emotion Knowledge Interventions**

There are interventions described in the literature that focus on building emotional competence and other early social skills such as social problem solving, but these have not been designed specifically for children with developmental disabilities. Two such interventions that feature prominently in the literature are the Emotion Based Programme (EBP, Izard et al, 2008) and Promoting Alternative Thinking Strategies (PATHS, Kusche & Greenberg, 2011).

#### *Emotion Based Programme*

Izard et al (2008) studied the effects of an Emotion Based Programme (EBP) on the emotional competence of 3 and 4 year old children enrolled in Head Start, a support programme in the U.S for low income families. The EBP entails 20 lessons over 20 weeks focused on joy or happiness, sadness, anger and fear, interest and contempt. The lessons consisted of a puppet show to introduce the emotion and interactive games and stories to enable the children to learn about the emotion. Children were given the opportunity to label emotions and facial expressions in others using pictures and stories and were able to compare intensities of the emotions. They were also asked about what causes the emotion in them, for example, “what makes you sad?”

The lessons included several techniques for regulating emotions for example, the ‘Hold Tight’ technique for anger regulation, which encourages children to hug themselves or

another person tightly, or hold tight onto something soft, take three deep breaths, use words to negotiate and play fair.

There was an emphasis on creating a safe and supportive environment for the children during the lessons so they were able to safely explore their own emotions and those of other children. The underlying assumption was that increasing children's ability to understand and articulate their feeling states or emotion experiences will increase their conscious control of them. Parent involvement in the programme was also emphasised, with weekly messages sent home which summarised or outlined one key highlight from each lesson, plus included a discussion or activity to do with their child before their next lesson.

Izard et al (2008) conducted two studies using the EBP. In Study 1, the sample of children was from a rural population, all of whom attended the Head Start programme. The EBP was compared to Head Start as normal, it was found that emotion knowledge increased for 4 year olds but not 3 year olds, all children displayed improved emotion regulation, adaptive behaviour did not increase but both internalising and externalising maladaptive behaviour did decrease.

In Study 2 the sample was from an inner city population, again who all attended the Head Start programme. In this study, the EBP was compared to a similar social problem solving programme called 'I Can Problem Solve', administration changes were made to suit the new population along with changes to the content in an attempt to make the programme more engaging for the younger children. This time round both age groups of children made improvements in emotion knowledge and regulation and there was an increase in adaptive behaviour as well as a decrease in maladaptive behaviour. However, apart from the minor changes to the program, Izard et al (2008) were unable to explain why adaptive behaviour increased in Study 2 compared to Study 1.

Although more research is needed to make any firm conclusions, it seems that the EBP may be an effective programme to improve young children's emotion knowledge, and decrease their behaviour problems.

### *Promoting Alternative Thinking Strategies (PATHS)*

Promoting Alternative Thinking Strategies (PATHS, Kusche & Greenberg, 2011) was developed as a whole school emotional literacy programme for primary school aged children. The curriculum is based on a number of theoretical models such as the ABCD (affective, behavioural, cognitive, dynamic) model, the eco-behavioural systems model, neurobiology, psychoanalytic education and emotional intelligence theory (Kusche & Greenberg, 2011). The skills taught in the programme involve five main themes: self-control, emotional understanding, interpersonal problem-solving skills, self-esteem and peer communication and relationships. The skills taught are based on the following principles:

- To effect significant changes in children's social and emotional competence, it is necessary to focus on emotions, behaviour and cognitions.
- Children's ability to understand their own and others' emotions is a central component of effective problem-solving and social interactions.
- The school is a critical environment for the child and one that is capable of being a central locus for change.
- Children's ability to understand and discuss emotions is related to their ability to inhibit behaviour through verbal self-control (Kusche & Greenberg, 2011).

The lessons are organised into three units:

1. Readiness and Self Control Unit - This unit focused on emotion regulation techniques such as the 'Turtle Technique' which encourages children to withdraw from the situation, like a turtle would withdraw into their shell, take some deep breaths and use

an emotion vocabulary to deal with the situation once they are calm (Curtis & Norgate, 2007).

2. Feelings and Relationship unit –This unit is based on interpersonal and emotional understanding (Curtis & Norgate, 2007), it teaches children that feelings are either comfortable or uncomfortable, all feelings are ok to have, not all behaviours on the other hand, are okay. Children are taught to judge or evaluate behaviours rather than feelings. The children are also taught how their feelings communicate useful information to themselves and others, and how they can use this information to help them deal with situations. Feelings face cards are used to learn the emotions and are kept in boxes to use with an ‘I feel . . .’ strip so children can easily communicate how they are feeling. This unit also includes the use of the Control Signals poster, where the red light signals the children to stop and calm down, yellow for *go slow and think* and green for *go and try my plan*. There is also an evaluation section where children can reflect on how their plan worked out (Kam et al, 2004).

3. Problem solving unit – This unit focuses on interpersonal problem solving (Curtis & Norgate, 2007). In particular, these lessons focused on identifying problems and feelings, generating alternative solutions, evaluating consequences, and selecting the “best” plan.

There have been many researchers who have studied the effectiveness of the PATHS curriculum (Greenberg et al, 1995, The Conduct Problems Prevention Research Group, 1999, cited in Curtis & Norgate, 2007; Kelly et al, 2004; Domitrovich et al, 2007, Curtis & Norgate, 2007). These researchers have observed improvements in emotional vocabulary, emotional understanding, tolerance, social skills and peer relations, aggressive problem solving strategies, empathy, managing emotions and handling relationships.

## **Interventions for Improving Behaviour Problems in Children with Developmental Disabilities**

Evidence has been presented here for how a lack of emotional knowledge can put children at risk of developing internal and external behaviour problems (Denham 1998) and it seems that children with developmental disabilities are both at risk of developing behaviour problems, and may have impairments in emotional competence. There are effective programmes for teaching emotional competence, albeit for typically developing children. Therefore, teaching emotional knowledge skills is likely to be important in order to help ameliorate the risks, faced by these children, for developing behaviour problems.

Goleman (1995) agrees, suggesting that emotional competence is so crucial for children that teaching these skills may in fact work as a resilience factor in the development of behaviour problems, even in the face of other risk factors. In a review of the literature, Mitchell & Hauser-Cram (2009) found that the challenging behaviour of young children with developmental delays was both under-identified and insufficiently addressed in early intervention programs and instead priority was given to teaching pre-academic skills such as fine motor, language and cognitive development (Mitchell & Hauser-Cram, 2009).

Roberts et al (2003) conducted a review of the literature on early interventions for behaviour problems in preschool children with developmental disabilities. Most interventions found were family based due to the young age of the child, and all were based on applied behaviour analysis or social learning theory (Roberts et al, 2003). None of the interventions discussed within the review seemed to contain any emotional competence strategies, and the relation between emotions and behaviour was not acknowledged. The majority of the interventions used Parent Management Training which essentially involves teaching parents to identify, define and observe problem behaviours then to use strategies based on social learning principles to intervene directly with their child at home (Baker 1996, cited in

Roberts et al, 2003). The interventions involved discussion, modelling, role play, home practice and direct feedback. All studies included in the literature review reported positive outcomes in terms of building competencies and reducing problem behaviours, although it was agreed that there was a need for further research in the form of randomised controlled trials to strengthen the claim of positive outcomes. Interestingly, the studies which reported the most successful improvement were those that adapted their procedures to the specific needs of parents of children with disabilities and included active as well as instructive techniques, such as modelling and role play. Some interventions were provided within a group format, which was thought would provide social support opportunities for families and allow peer modelling of skills, as well as being more cost effective. Although positive results were reported, the small number of studies included used small sample sizes and weak research methods, thus ensuring a need for more research to ascertain whether parent training programmes, offered in a group situation can lead to improvements in problem behaviour in children with disabilities.

Since the review by Roberts et al (2003) an intervention, based on the principles that Roberts et al (2003) reported as being effective in such programmes, has appeared in the literature. This is the behavioural family intervention Stepping Stones Triple P' (SSTP; Sanders, Mazzucchelli, & Studman, 2003, cited in Roberts, Mazzucchelli, Studman & Sanders, 2006).

Stepping Stones Triple P is an adaptation of the Triple P Positive Parenting Program (Sanders, 1999, cited in Roberts et al 2006) for families of children with developmental disabilities. It is an individually delivered 10-session parenting program that includes sessions on the causes of child behaviour problems, strategies for encouraging children's development and strategies for managing misbehaviour (Roberts et al, 2006). The parent training consists of manual and video demonstrations of positive parenting, assessment and discussions with a



therapist and clinic and home observations. Parents are also invited to take part in additional modules focused on topics such as marital communication, parenting teamwork, mood management and coping skills. The programme has been found to generate positive findings such as reductions in child behaviour problems along with the increased use of positive parenting techniques (Roberts et al, 2006). Similar to those interventions found in Robert et al's (2003) review, Stepping Stones does not include an emotional component, even though emotions have been shown to play a role in the development of behaviour problems (Trentacosta & Fine, 2006).

### **Emotion Based Interventions for Children with Developmental Disabilities**

A review of the relevant literature was conducted to find those emotion knowledge interventions for children with developmental disabilities. The terms 'children', 'disabilities', 'emotion knowledge' or 'emotion competence' or 'emotion understanding' and 'intervention' or 'programme' were entered into databases such as psycINFO, ERIC, Education Research Complete, eBook Collection (EBSCOhost), Australia/New Zealand Reference Centre, PsycBOOKS and PsycARTICLES. Four articles were found that were directly relevant to the literature search, these are summarised in Table 1. Downs and Strand (2008) used direct instruction to teach emotion recognition to preschool children with developmental delays in one or more areas of functioning (communication, motor skills, social/adaptive behaviour and/or cognition. Some of these children had a specific diagnosis of Autism. Each child in the experimental group received between 30 and 42 hours of Emotion recognition instruction through DTT over a course of 27 weeks at an average of one and a half to two hours per week. Children in the control group received training that was no different to their normal preschool curriculum. It was found that children in the experimental group improved their emotion knowledge over the school year, more so than the children in the control group. Interestingly, children with Autism showed less of an improvement than did children with

other diagnoses, these children also had the most severe receptive language delays. These findings suggest that emotion knowledge is a skill that can be taught to some children with developmental disabilities using an intensive, long-term, discrete-trial training program.

**Table 1**

Literature Review for Emotion Based Interventions for Children with Developmental Disabilities

	Participants	Control Group	Intervention Method	Length of intervention	Results
<b>Downs &amp; Strand (2008)</b>	16 Preschool aged children with developmental delays and disabilities	Intervention versus education as normal	Discrete Trial Training (DTT)	27 Weeks	Emotion recognition scores significantly higher for the experimental (mean 7.75, <i>sd</i> 4.80) than for the control (mean 2.28, <i>sd</i> 2.39) group, $z = -2.24$ , $p < .05$ .
<b>Kam, Greenberg &amp; Kusche (2004)</b>	133 students aged 8 with disabilities, attending special needs schools	Selected experimental schools or comparison schools	Emotional Literacy curriculum	Three years	Growth curve analysis indicated intervention reduced rate of growth of teacher-reported internalising and externalising and produced a sustained reduction in child-reported depressive symptoms
<b>Greenberg &amp; Kusche (1998)</b>	57 school-aged deaf children	Wait-list control group	Emotional Literacy Curriculum	Two years	Significant improvement in children's social problem-solving skills, emotional recognition skills, and teacher- and parent-rated social competence
<b>Bauminger (2002)</b>	15 high functioning children with autism (4 girls, 11 boys), 8 – 17 years	N/A	CBT based in-school programme	Seven months	Improvements made in social cognition, social interaction and emotion understanding

Kam et al (2004) examined the long term effectiveness of PATHS for school aged children with special needs, fifty-three of whom had learning disabilities, 23 had mild intellectual disability, 31 had emotional and behavioural disorders, 21 had physical disabilities or health impairments (many of these children had attention-deficit/hyperactivity disorder), and 5 had multiple handicaps. A 60-lesson version of the PATHS programme was used that was adapted specifically for children in the second and third grades (children aged seven to nine years), and placed greater emphasis on behavioural self-control rather than the more advanced steps of problem solving. Teachers were trained to use PATHS by attending a three day workshop. The PATHS sessions occurred three times a week and lasted 20 to 30 minutes.

It was found that the children in the special education classrooms exhibited higher baseline levels (measured at first grade) of externalising and internalising behaviours, higher levels of depression, and lower levels of emotional understanding and social problem-solving skills. However after the implementation of the PATHS curriculum, the levels of externalising behaviours decreased, the increase over time in internalising problems was much slower in the treatment group than in the control group, and there was an increase in the use of a feelings vocabulary. Moreover, it was observed that less aggressive solutions to problems were used by these children; they were more likely to use solutions that were non-confrontational and that demonstrated self-control. All of these effects were found to have been maintained at a 2-year follow up (Kam et al, 2004).

Greenberg and Kusche (1998) examined the effects of PATHS for school aged deaf children. They found improvements in affective and social cognitive understanding, cognitive functioning, and teacher- and parent-reported social competence and behaviour. Compared to the non-intervention group, children in the intervention group made significant improvements

in interpersonal cognitive problem-solving skills, emotional understanding, and aspects of cognitive performance.

Bauminger (2002) evaluated the effectiveness of a CBT based programme in teaching social cognition, social problem solving and emotion understanding to children aged between eight and 17 with high functioning autism. The programme was administered at school for three hours a week as part of each child's individual education plan (IEP). Parents and peers of the children also played a role in helping the children to practise the skills they had learnt. After the seven-month intervention period, it was found that the children were more likely to initiate positive peer interaction and to make eye contact with their peers, they were more likely to provide relevant solutions to social problems and they showed a greater understanding of complex emotions such as embarrassment and guilt.

As can be seen from the results of the literature review above, research into emotion knowledge interventions for children with developmental disabilities is sparse. Downs & Strand (2008) report that there has been some research that has indicated that interventions can improve the emotion recognition of adults with a range of disabilities (McKenzie, Matheson, McKaskie, Hamilton & Murray, 2000; McAlpine, Nirbhay, Ellis & Kendall, 1992; Bolte, Hubl, Feineis-Matthews, Dierks & Poustka, 2006; Guercio, Podolska-Schroeder, Rehfeldt, 2004; cited in Downs & Strand, 2008), however the results with children have been somewhat inconsistent. In regards to children with high-functioning autism, Bauminger (2002) suggests that it has only been recently that interventions have moved away from a specific focus on the peer interaction aspect of social difficulty, which is usually taught through some form of social skills training. Instead research is now being directed to the social cognition and emotion understanding deficits in these children (Bauminger, 2002).

It seems that the area of social and emotional competence in children with developmental disabilities is reasonably new. There have been some interventions designed

to target these skills, all of which seem to have promising results, however there is a need for additional research in order to establish whether these interventions are effective.

### **Aim of this study**

Considering the relationship between behaviour problems and emotion and that both have been shown to be common problems for children with developmental disabilities, it may be beneficial for these children to receive an emotion knowledge intervention, aimed at reducing their behaviour problems. To date no study has investigated this. Promoting Alternative Thinking Strategies is a programme that has been shown to improve both emotion knowledge and behaviour problems in school aged children. The research question investigated was; can using an adapted version of the PATHS programme with children and adolescents aged between 9 and 18, who have developmental disabilities, improve both their emotion knowledge and behaviour problems?

## **CHAPTER 2**

### **GENERAL METHOD**

#### *Design*

A single case design was implemented to investigate the research question. This design uses a baseline and an intervention phase, enabling each participant to serve as their own control (Cakiroglu, 2012). It also allows the researcher to use individual analysis and measure each participant's own performance, without aggregating or averaging any data (Cakiroglu, 2012).

#### *Pilot Study*

Participant A acted as a 'pilot' participant, in order to support the adaptations made to the PATHS programme and to ensure the study measures were put together efficiently. When interpreting this participant's results, it should be kept in mind that the intervention she received differed slightly to that of the other participants. Participant A's results are presented in a separate section to the other participants'.

#### *Participants*

Four children and adolescents aged between nine and 18 with various developmental disabilities were identified by their parents as displaying frequent problem behaviours, thought to stem from difficulty in communicating, understanding or regulating their emotions. Summary participant information is provided in Table 2.

**Table 2**

## Participant Information

<b>Participant Number</b>	<b>Gender and Age</b>	<b>Disability Information</b>	<b>Behaviour Problems Identified</b>	<b>Other Information</b>
<b>A</b>	Female, 9	Down syndrome Impaired Speech due to severe stutter	Hissing and Growling Hitting	Attends a main stream primary school
<b>1</b>	Male, 12	Autism	Argumentative verbal remarks, silly inappropriate behaviour	Attends a special needs high school.
<b>2</b>	Female, 18	Autism	Screaming, stamping feet when unable to do something Non-compliance to mother's requests	Attends a special education unit that is part of a main stream high school.
<b>3</b>	Male, 12	ADHD, Specific learning Disability (SLD) and oppositional behaviour	Delayed compliance to requests Oppositional and defiant behaviours	Currently in foster care and attends a special needs high school.

*Recruitment*

Local schools and speech and language therapists were contacted and informed of the study. They were given information sheets to forward on to any parents whose children fit the study criteria (the information sheet is attached as Appendix A). Parents were asked to contact the researcher for more information, after which a meeting was organised to further discuss involvement in the study and to assess the children to see if they met the inclusion criteria (see below). Several potential participants either elected not to participate or were unsuitable for the study due to being non-verbal, having no behaviour problems, or having multiple, complex disabilities.



Participant's parents were given consent forms to sign (the consent form is attached as Appendix B). A child-friendly version of the information sheet and consent form (see Appendix C) was read to each participant by the researcher. Each participant was also asked to sign this form to show that they are willing participants.

### *Setting*

All of the meetings and the intervention sessions took place at the location that was most convenient to the participant and their family. For three participants this was their home, and for one participant the first two weeks and the last two weeks of the intervention were carried out at school and the remaining sessions were completed at the family's home. Parents were invited to attend the intervention sessions with their child in order to learn the material and be able to use it between sessions, and also in case of their child become distressed whilst talking about their feelings and experiences. In the case of the participant who had four sessions at school, a teacher aide was available at all times.

### *Materials*

The intervention material includes the emotional literacy curriculum 'Promoting Alternative Thinking Strategies' (PATHS, Kusche & Greenberg, 2011), which includes a curriculum manual, posters, handouts, activity sheets and a pack of feelings face cards. Participants are also given a folder to keep all of their work in and a 'mailbox' (a 25 x 15cm cardboard box) to use when they have problems that they wish to solve, or things that they wish to discuss during the sessions. Paper and felt pens were also used to record the material covered in each session.

## *Measures*

### *Screening measures*

Semi-structured interview (see Appendix D): This interview was administered to gain extra qualitative information about each participant, particularly around their behaviour problems and their individual developmental disability. The information gained from this interview was used to support the researcher and parent to decide on the two behaviours for measurement during the study.

Peabody Picture Vocabulary Test –IV (Dunn & Dunn, 2007): the PPVT-IV is a test designed to measure a person's receptive language ability and has been found to have good content, construct, internal, and criterion validity (Williams, 1999). The norms are based on 1994 US census data (Williams, 1999), which although dated still provide useful and relevant information on the New Zealand population. Included in the normative sample were special populations such as individuals with learning disabilities, speech and cognitive impairments (Williams, 1999), which makes the measure appropriate to use with children with developmental disabilities.

During administration of the PPVT-IV, children are given a stimulus word verbally by the researcher and then asked to select one picture from an array of four presented to them which best illustrates the meaning of the stimulus word. Using the PPVT-IV as a screening measure provided an indication of the participant's receptive language ability, and allowed the researcher to judge whether it was likely that the participant would be able to engage with the intervention material.

Vineland Adaptive Behavior Scales, Second Edition – Survey Interview Form (Sparrow, Cicchetti & Balla, 2005): The Vineland-II is an individually administered, semi-structured interview which measures the adaptive behaviour of individuals from birth – 90

years of age. There are four subdomains included in the Vineland-II; Communication, Daily Living Skills, Socialisation and Motor Skills. A Maladaptive Behaviour Index is also included. Reliability coefficients for the sub-domains and for the Adaptive behaviour composite have been found to be generally very high (Sparrow et al, 2005). The Vineland-II has also reported to have strong content validity, and the test has been shown to correlate highly with other measures such as the Wechsler Intelligence Scale for Children, Third Edition, the Wechsler Adult Intelligence Scale, Third Edition and the Behavior Assessment System for Children, second edition (Sparrow et al, 2005). Participants of the current study were administered the Communication Domain, which looks at Receptive, Expressive and Written Communication, the Socialisation Domain, which looks at Interpersonal Relationships, Play and Leisure Time and Coping Skills and the Maladaptive Behaviours which notes the occurrence and severity of a range of Internalising, Externalising and Other maladaptive behaviours.

#### *Intervention measures*

Emotion Knowledge Test (EKT) – this test was developed for this study and was based on the Emotion Matching Task (EMT, Morgan, Izard & King, 2010) and an emotion knowledge assessment used by Michalson & Lewis (1985).

The EMT has four parts. Part One is matching expressions, where children are asked to match the picture of a child who is feeling the same as the child in the target picture. Part Two is an expression-situation matching task which requires the child to choose the picture of a child who is showing the same as a child in a specific situation. Part Three is expression labelling, where the child has to name the expressions shown in each of the pictures and Part Four is expression-label matching, where the child is asked to select the picture of a child showing a specific emotion (Morgan et al, 2010).

The emotion knowledge assessment used by Michalson & Lewis (1985) involves three tasks: *Labelling* - where the child is asked to name the emotion that a girl is feeling in a series of pictures; *Comprehension* - where the child is given an emotion label and they have to choose the corresponding picture; and *Situational Knowledge* - where the child is shown a line drawing of a scenario in which a specific emotion is likely to be elicited and the child is asked to label that emotion.

The Emotion Matching Task has been found to have good convergent and criterion validity (Morgan et al, 2010) and each of the three tasks involved in Michalson and Lewis' assessment have been found to have adequate reliability with internal consistency coefficients ranging between 0.56 to 0.68 (Bennett, Bendersky & Lewis 2005).

The EKT was developed with a procedure similar to those described above. The participant was given two tasks; labelling the emotion shown in a number of photographs of facial expressions and labelling the emotion displayed in a number of sentences describing children in different social situations. Participants were able to label the emotions in both the photographs and the sentences using words, or by selecting the appropriate emotion from the provided printed and laminated emotion labels. The emotion knowledge assessment used by Michalson and Lewis (1985) and the EMT (Morgan et al., 2010) are both designed for younger preschool children. As this study is based on older children, a wider range of emotions were covered in the test and photographs were used instead of cartoons to depict the facial expressions as these are more age-appropriate. The photographs have been selected from the internet and include faces of individuals from a range of ethnicities, ages and genders. The sentences were written by the researcher and are based on age-appropriate activities. The EKT was used as a baseline of the participant's emotion knowledge, and then was administered once every two weeks as a running record of the participant's learning. A post test measure was taken at the follow-up session.

When scoring the EKT, children were given a score of two for items that have been answered correctly and one point for answers that were not exactly correct but were the same valence of the target emotion. For example a child would score 1 if they responded '*sad*' to an item where the target emotion is *angry*, they would score 0 if they responded '*happy*' to the same item. Items for which the target emotion was '*bored*' or '*disgusted*' can only receive scores of 0 or 2. Items for which the target emotion is '*surprised*' or '*shocked*' can receive a score of 1 in the sentence task if they responded with an emotion of the same valence as the sentence. For example, if the surprise was a positive one such as receiving a gift, a child would be scored 1 if they respond '*happy*', but 0 if they respond '*sad*' or '*angry*'. A score of 1 was given if a child responded '*scared*' to items where the target emotion was *nervous*.

#### *Validation of the EKT*

A small, informal pilot study was conducted to ensure that the photographs and stories used are valid examples of the target emotions. A group of five children aged between 10 and 14, known to the researcher through friends were recruited for this exercise. The children were asked to write what emotion they thought each picture and sentence was portraying. The items for which at least three out of the five children answered correctly were kept and those that only one or two of the children answered correctly were discarded. The reason for this was that children in this age group are not expected to be able to get every item correct due to their level of emotional development, however, the items are not expected to be too difficult so that only two out of the five children were able to answer them correctly. The final EKT included photographs displaying the following emotions; happy, sad, angry, bored, nervous, scared, disgusted, surprised. The sentences included all of the above emotions except bored and also included disappointed and excited. The EKT items were divided randomly into Tests one to seven; each test included two items of each emotion. Appendix F includes examples of the photographs and sentences used in the EKT.

### *Inter-rater Reliability of the EKT*

A colleague was asked to score six randomly selected tests, two from each participant, in order to assess inter-rater reliability. The percentage of agreement between the researcher and the second rater was calculated to be 94.6%.

Behaviour Diary: To record changes in the participants' behaviour, parents were asked to complete a behaviour diary (see Appendix E). During the initial interview parents were asked to identify two common problem behaviours displayed by their child that they perceived as stemming from the child's difficulties communicating, understanding or regulating their emotions. These behaviours were identified as the target behaviours that parents were asked to record every day the frequency of throughout the study.

### *Procedure*

- Initial meeting

After the parents had contacted the researcher regarding their interest in participating in the study, an initial meeting was set up, attended by the researcher, the parent/caregiver and their child. In the case of Participant 3, the study was discussed over the phone with his social worker before a meeting was arranged with his caregiver. Sometimes the initial meeting would run over two sessions as it took approximately 1.5 hours. During this meeting, the parent/caregiver was given more information about the study and what their and their child's participation would entail. Both the parent/caregiver and the child were given consent forms to sign. The parent/caregiver was introduced to the behaviour diary and coached on how to use it correctly. Two problem behaviours were identified that would then act as target behaviours for the intervention. The behaviour diary was completed from that day forward, the first two weeks were for a baseline measurement of the participant's behaviour problems. Also during this meeting, the parent/caregiver was administered the semi-structured

interview, the Vineland-II - Survey Interview Form, and the participant was given the PPVT-II and the EKT – Test 1 as a baseline measure of the participant's emotion knowledge.

- Intervention phase

The intervention sessions were 40 – 60 minutes each and occurred twice a week for eight weeks. The PATHS programme was individually tailored to suit each participant, so some lessons and activities were not used with all of the participants, and the pace at which the material was covered differed for each participant. Along with the PATHS material, discussions were also held that covered the following emotions *Angry, Happy, Sad, Disappointed, Nervous, Surprised, Worried* and *Scared*. These discussions were spread out throughout the intervention sessions and included questions such as: What does each of these emotions feel like and look like? What does the participant do when they feel this way? Is the emotion a comfortable or uncomfortable feeling? What are some things that the participant can do to feel more comfortable?

During weeks one, three, five, and seven the participants were given the EKT as a record of their emotion knowledge, and every week the behaviour diary was collected from the parent/caregiver.

- Follow-up

Three weeks after the last intervention session, there was a follow up session with each participant and their parent/caregiver. During this session the participant completed the EKT, the last behaviour diary was collected, and the parent was re-administered the Socialisation and Maladaptive Behaviour subdomains of the Vineland-II. The researcher also discussed with the parent how they felt the programme had been for their child, and whether there had been any other observable changes that had not been captured by the study's measurements.

## **CHAPTER 3**

### **PILOT STUDY**

#### *Inclusion Criteria*

The initial study inclusion criteria after participants were children aged between 8 and 12, with communication difficulties, developmental delays or disabilities and with behaviour problems that were thought to stem around difficulties communicating, understanding or managing their emotions. It was decided that a pilot participant was needed to allow the researcher to trial the adapted version of the PATHS programme and the measures that were designed specifically for this study such as the behaviour diary and EKT.

#### **Participant information**

##### *General*

Participant A (pseudonym Angie) was a nine year old girl with Down syndrome and a severe stutter. She lived at home with both of her parents and two younger siblings.

##### *Communication*

Owing to her stutter, Angie finds communicating with others difficult. At school she uses a picture system to communicate with her peers and teachers, she also uses some sign language and is in the process of receiving an electronic communication device.

As shown in Table 3, Angie scored below the first percentile on the PPVT-IV, indicating that she had significantly delayed receptive language ability. Angie's scores on the Vineland-II Communication domain were in the low average range, however her scores on the Receptive and Expressive subdomains were low for age. Her score on the Written subdomain was higher than average for her age, which would make her overall score higher. In order to assist with communication, her mother attended each session.



**Table 3**

Angie's scores on measures taken at initial interview

<b>PPVT-IV</b>	<b>Vineland - Communication</b>	<b>Vineland - Socialisation</b>	<b>Vineland - Maladaptive Behaviour</b>
0.1 <sup>st</sup> percentile	21 <sup>st</sup> percentile	9 <sup>th</sup> percentile	Elevated

*Percentile scores are presented for all measures, apart from the Maladaptive Behaviour domain of the Vineland-II, for which the range is presented.*

#### *Behaviour*

Angie's mother reported that when frustrated, Angie would often hit, hiss or growl at others around her. This was happening at least once a day. Table 3 shows that Angie's maladaptive behaviour was in the elevated range on the Vineland-II, and that she scored within the 9<sup>th</sup> percentile on the Socialisation domain, suggesting difficulties in both of these areas.

## **Results**

### *The Intervention*

Angie received 16 intervention sessions, with two one-week breaks between Week 3 and Week 4 and between Week 6 and Week 7. This was due to Angie's family's schedules during this time.

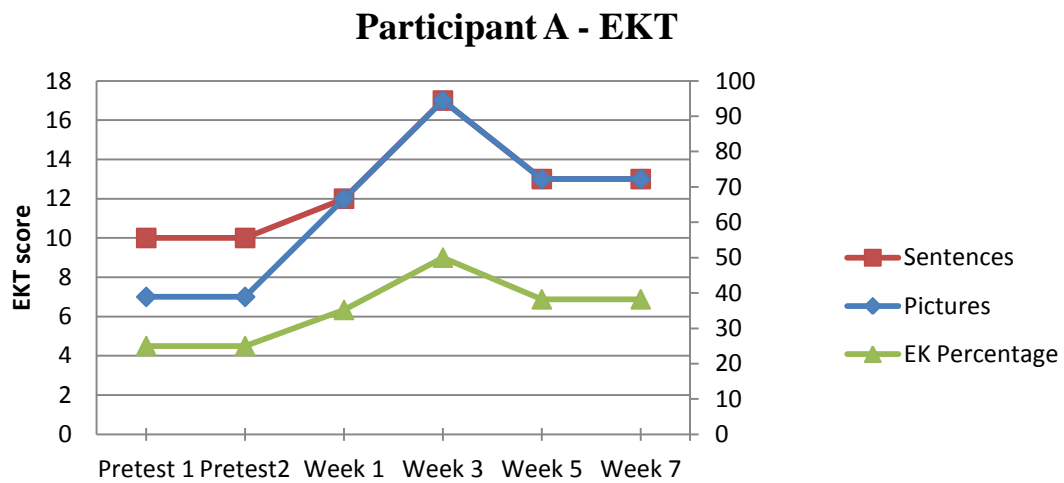
### *Data*

Data was collected every week throughout the intervention period although the target behaviours (e.g. *hit*, *hiss*) were not differentiated on the behaviour diary.

### *EKT*

Angie's overall score on the EKT was 25 % at Baseline and improved over the 8 week intervention phase to 38.2% at Week 7. This improvement was more marked on the

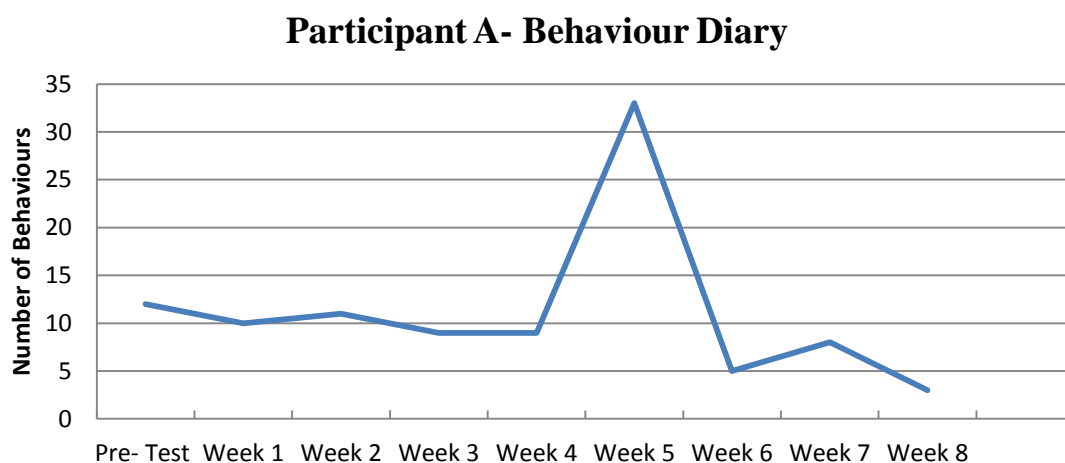
sentence- labelling task (an improvement of 6 points) than on the photograph labelling task (an improvement of 3 points). Angie's scores on the EKT can be seen displayed in Figure 1.



**Figure 1:** Angie's scores on the EKT

### *Behaviour Diary*

Figure 2 demonstrates that Angie's behaviours reduced from 12 per week to 3 per week throughout the intervention. There was a peak during Week 5 when the number of behaviours rose to 33.



**Figure 2:** Angie's behaviour diary

### *Parent observations*

Angie's mother reported that towards the end of the programme, Angie began to seek out her mother and tell her that she had a problem, for example a disagreement with a sibling, rather than hitting, hissing or growling.

### **Discussion**

Over the intervention period, Angie's overall score on the EKT improved, particularly in the sentence-labelling task, however Angie's scores were still low indicating that her understanding of emotions was still relatively low. This finding is in line with Kasari et al (2001) who report that children with Down syndrome have delays in emotion knowledge. However it seems that these delays may be improved through the use of an emotion knowledge and social problem solving intervention such as the adapted version of the PATHS programme used in this study.

Angie's problem behaviours were occurring 12 times a week at baseline. This had decreased to 3 a week by Week 8. Owing to the confusion over using the behaviour diary, there are questions around the accuracy of the data. After the last intervention session Angie's mother reported that she did not feel that her daughter's behaviour had improved, so the decrease in behaviours seen on the behaviour diary graph may be due to recording difficulties rather than an actual improvement in behaviour. There was also no distinction made between the types of problem behaviours being displayed so there was only an overall number of problem behaviours being recorded. At the end of Week 4, a prompt was given about using the behaviour diary. As can be seen in Figure 2, there was an increase in behaviours recorded the following week. The prompt may have resulted in the behaviour diary being used more thoroughly and more behaviours being recorded the following week.

Angie's mother reported that Angie had begun to seek her out when she had a problem, such as with a sibling, or if she needed help with something. Situations such as

these were used throughout the program as examples of problem solving, so it seems at the very least that Angie has developed an ability to recognise when there is a problem, and that seeking her mother is one way of dealing with those problems.

Although small improvements were noted both in emotion knowledge and behaviour problems for Angie, it was felt that some changes were needed to be made to make the intervention more effective. These changes are outlined below.

#### *Changes made after Pilot Study*

- The Behaviour Diary was adapted to include a simple tally system, and separate boxes to tally the different problem behaviours
- Recruiting participants who met all of the inclusion criteria proved to be challenging, therefore the criteria were broadened by removing ‘communication difficulties’.
- It was decided that future participants should be older than 9 years of age, as it was felt that some of the intervention material was not age-appropriate for Angie.
- A follow-up session was planned for future participants three weeks after the intervention phase had finished, that would include one more EKT and Behaviour Diary recording, along with a post test measure of the Vineland-II Socialisation and Maladaptive Behaviour domains. This came from the fact that there were problems with recording Angie’s problem behaviour, and there were no other measures to use to determine if change had occurred.

## **CHAPTER 4**

### **MAIN STUDY**

This chapter includes the results collected from three participants that formed the main study. Each participant's results are presented and discussed separately with a general discussion presented in the following chapter.

#### **Participant 1**

##### **Participant Information**

###### *General*

Participant 1 (pseudonym Tom) was a 13 year old boy with high functioning Autism, who lived at home with his mother, step-father and an older brother who has Aspergers syndrome. Tom attended a high school dedicated to children with special needs.

###### *Communication*

Table 4 shows that Tom's scores on the receptive language measure (PPVT-IV) and on the Communication domain of the Vineland-II were in the low range. To aid communication, and Tom's understanding of the intervention material, activities that involved in-depth discussions were removed from the programme, along with sessions that were based on complex concepts such as stereotyping.

###### *Behaviour*

Tom's mother reported that Tom argued regularly, which often lead to him becoming physically aggressive towards his brother, and that he displayed inappropriate behaviours such as laughing at people and joking around at inappropriate times. Tom's score on the Socialisation domain of the Vineland-II was in the 1<sup>st</sup> percentile and his score on the Maladaptive Behaviour domain was in the clinically significant range, suggesting he experienced significant difficulties in both these areas.

## Results

### *The Intervention*

Tom participated in all 16 intervention sessions, over 8 weeks. There are no missing data.

### *Vineland-II*

Tom's score on the Socialisation domain was within the 1<sup>st</sup> percentile at baseline. This had improved to be within the 2<sup>nd</sup> percentile at follow up. Tom's age equivalent score on the Interpersonal Relationships subdomain increased from 3 years 8 months to 6 years 5 month at follow up. Tom's score on the Maladaptive Behaviour domain was within the Clinically Significant range at baseline, his score had decreased to fall within the Elevated range by follow up. Tom made more of an improvement on the Externalising subdomain than he did on the Internalising domain.

**Table 4**

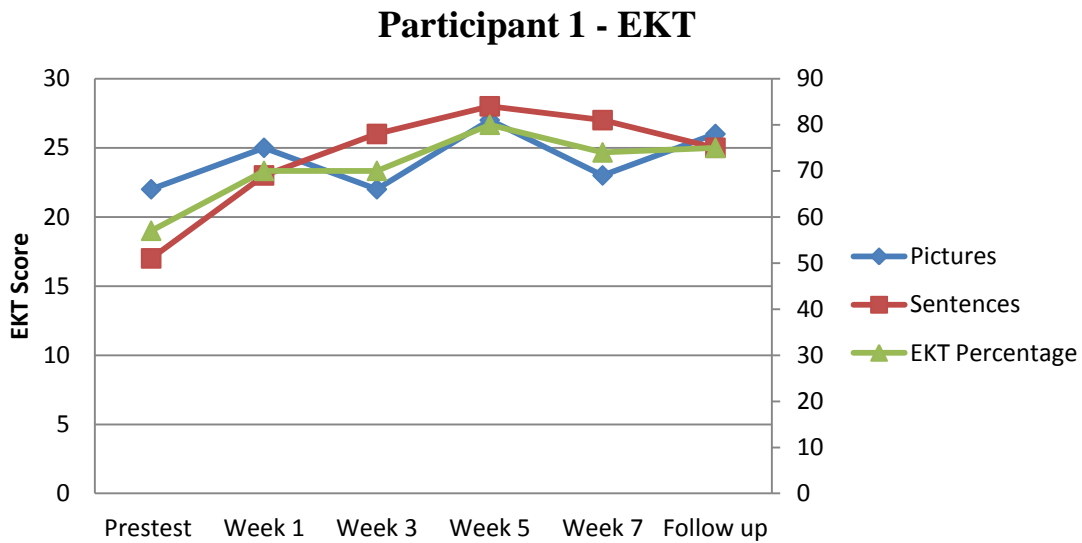
Tom's Baseline and Follow Up measures

<b>PPVT-IV</b>	<b>Vineland Communication</b>	<b>Vineland Socialisation</b>		<b>Vineland Maladaptive Behaviour</b>	
		<i>Baseline</i>	<i>Follow Up</i>	<i>Baseline</i>	<i>Follow Up</i>
134 (5 <sup>th</sup> percentile)	72 (4 <sup>th</sup> percentile)	66 (1 <sup>st</sup> percentile)	73 (2 <sup>nd</sup> percentile)	23 (Clinically significant)	20 (Elevated)

*For each measure the standard scores are presented, along with percentile scores for the PPVT-IV and the Communication and Socialisation domains of the Vineland-II. The ranges for the Maladaptive Behaviour domain scores are also presented.*

### *EKT*

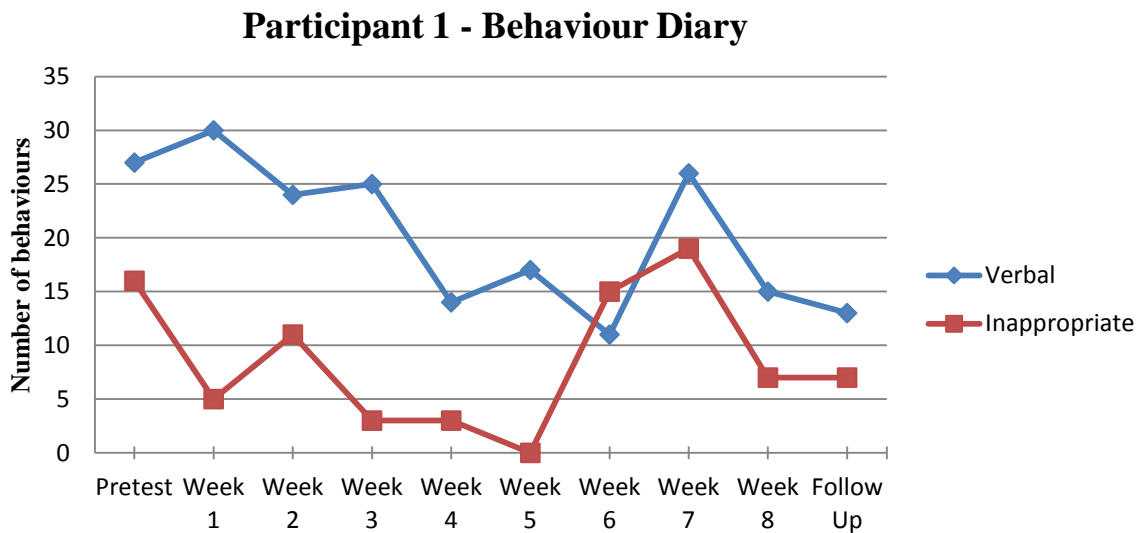
Figure 3 shows that Tom's score on the EKT improved over the course of the intervention period from 57% to 74% and was 75% at follow up. Tom's performance indicated more of an improvement in the sentence-labelling task than in the photograph-labelling task.



**Figure 3:** Tom's EKT Scores

#### Behaviour Diary

As can be seen in Figure 4, Tom's problem behaviour decreased over the first five weeks of the intervention phase. In Week 6 and 7 Tom's problem behaviours occurred more frequently, and then decreased again in Week 8. At follow up the behaviours were similar to reported Week 8 levels.



**Figure 4:** Tom's Behaviour Diary

### *Parent Observations*

Tom's mother reported that Tom is more likely to use problem solving skills when something is bothering him since the intervention. For example, if someone at school had been annoying him, Tom would come home and tell his mum that he had decided to ignore it and walk away. Before the intervention, Tom was likely to complain about this person and get worked up about the problem. It was also reported that Tom had been receiving good feedback from school, saying that he seems more mature and less disruptive in the classroom. Tom's mother stated that there continued to be issues with Tom and his brother fighting at home.

### **Discussion**

Tom's relatively low scores on the PPVT-II and on the Vineland-II Communication domain could be attributable to the fact that Tom was non-verbal until he was around five years of age and may be indicative that Tom's language development is behind that of other children of a similar age.

Tom scored poorly on the Vineland-II Socialisation domain at baseline, which may be understood in terms of his diagnosis of autism; one of the main impairments of the disorder lies in social and interpersonal skills (Autism New Zealand Inc., n.d). Tom's mother reported that he finds making friends difficult as he resorts to silly and inappropriate behaviour to try and establish rapport instead of using conversation or age-appropriate activities. At follow up, Tom's score had improved on the Socialisation domain from the first percentile to the second percentile. Although this may seem to be a small improvement, closer examination of the subdomains indicated that Tom's age equivalent score for the Interpersonal Relationships subdomain improved by 2 years and 9 months.



Tom's score on the EKT improved over the intervention period, particularly on the sentence-labelling task, this improvement was maintained at the 3-week follow up. The sentences used in the EKT all describe a child in some social situation and the participant is asked to label the emotion that that child is most likely to be feeling in that situation. Improvements made on this task may indicate that Tom's understanding of people's emotions in social situations improved during the intervention. This may be linked to Tom's improvement on the Interpersonal Relationships subdomain of the Vineland-II in that understanding the emotions of others is likely to lead to more positive interactions with others (Denham, 1998).

Tom's score on the Vineland-II Maladaptive Behaviour domain was in the clinically significant range at baseline, which reflects Tom's maternal reports of his arguing and inappropriate behaviours. At follow up this score had fallen to the elevated range. Tom's externalising behaviours improved more so than internalising behaviours. Tom's behaviour diary reflects this decrease in problem behaviours throughout the intervention. However, during Weeks 6 and 7, the number of problem behaviours increased. Around this time, Tom's brother was having significant behaviour difficulties at home and at school, which Tom's mother reported as influencing Tom's behaviour. Tom's mother stated that the brother's "feed off each other", and "wind each other up" so that when one brother is having a hard time, it often effects the other brother's behaviour. However Tom's mother did report that Tom was trying really hard to use the skills he had learnt from the PATHs program such as talking to his mother about coming up with solutions to the problems he was having with his brother.

The results suggest that Tom made improvements during the intervention phase in regards to understanding the emotions of others, reducing argumentative behaviour and with displaying inappropriate, silly behaviours. Reports from Tom's mother also suggest that Tom

has learnt problem solving skills and was actively using them to solve his social problems by the end of the intervention phase.

## **Participant 2**

### **Participant Information**

#### *General*

Participant 2 (pseudonym Jane) was an 18 year old girl who lived at home with both of her parents and younger brother. She attended a special education unit within a mainstream high school.

#### *Communication*

As shown in Table 5, Jane's score on the receptive language measure (PPVT-IV) was at the 1<sup>st</sup> percentile, and her score on the Communication domain of the Vineland-II was at the 2<sup>nd</sup> percentile. This indicated that Jane experiences significant delays in language and communication. However, after discussion with Jane's mother, it was felt that these scores did not reflect an accurate picture of Jane's communication ability, and that Jane would be able to engage with the intervention material.

#### *Behaviour*

Jane's mother reported that Jane displayed problem behaviours such as stamping her feet and sometimes screaming when she finds something difficult, instead of asking for help and being resistant in the face of a change of activity. Jane's score on the Maladaptive Index of the Vineland-II was within the average range, suggesting that these behaviours were occurring no more frequently than with other individuals her age. Although she did not present with significant behaviour problems, it was decided to retain Jane in the study, as she did present with some inappropriate behaviours that occurred on a weekly basis and these

were thought to be related to her ability to regulate her emotions. Jane's score on the Socialisation subdomain was within the 0.1<sup>st</sup> percentile, suggesting that this is an area of difficulty for her. Coping Skills seemed to be less of a difficulty for her than Play and Leisure Time and Interpersonal Relationships, however scores on all three subdomains were low

## **Results**

### *The Intervention*

Jane participated in 16 intervention sessions. The first four and the last four sessions took place at school as this was the most convenient location for the family. Between Week 4 and Week 5 there was a two week break over the Christmas-New Year period. There was also a one week break between Week 5 and Week 6 due to the family's schedule.

### *Data*

As Jane's problem behaviour was not occurring very frequently (see Figure 6), Jane's mother did not complete the behaviour diary some weeks. Instead the number of problem behaviours recorded was a retrospective estimate rather than an accurate recording of the behaviour in real-time. It was felt however, that this estimate was reasonably accurate as the behaviours were significant events that would be easily remembered, and were not occurring a large number of times each week. The individual behaviours were not differentiated on the behaviour diary graph as behaviours were not occurring often enough, therefore the total observed behaviours was recorded.

### *Vineland-II*

At baseline, Jane scored below the 1<sup>st</sup> percentile on the Socialisation domain. On completion of the intervention programme, Jane's scores on all three subdomains of the Socialisation domain (interpersonal relationships, play and leisure and coping skills) had improved slightly meaning that her overall score went from being in the 'moderate deficit'

range to the ‘mild deficit’ range, although Jane’s overall score remained below the 1<sup>st</sup> percentile. There was no change in Jane’s score on the Maladaptive Behaviour domain.

**Table 5**

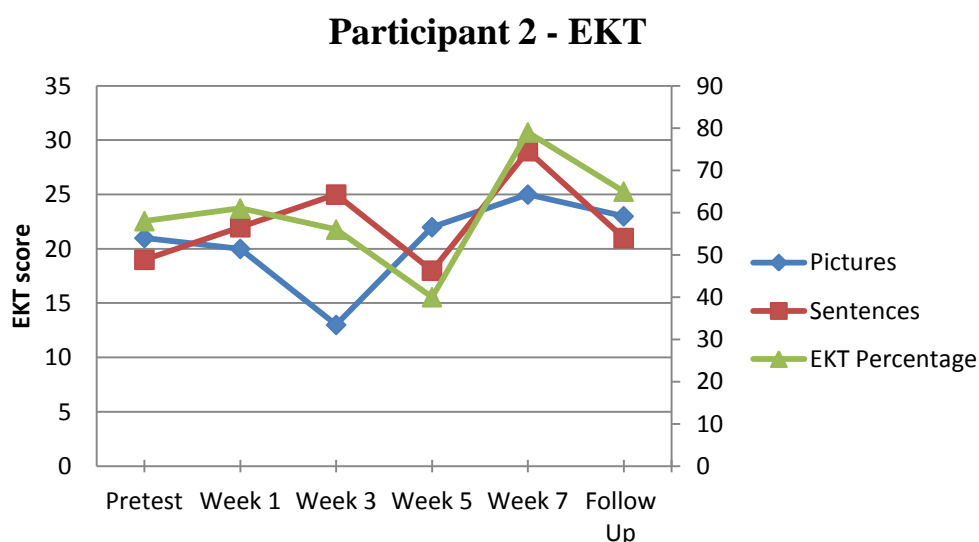
Jane’s Baseline and Follow Up Measures

PPVT-IV	Vineland Communication	Vineland Socialisation		Vineland Maladaptive Behaviour	
		Baseline	Follow Up	Baseline	Follow Up
144 (1 <sup>st</sup> percentile)	69 (2 <sup>nd</sup> percentile)	49 (0.1 <sup>st</sup> percentile)	57 (0.2 <sup>nd</sup> percentile)	17(Average)	17 (Average)

*For each measure the standard scores are presented, along with percentile scores for the PPVT-IV and the Communication and Socialisation domains of the Vineland-II. The ranges for the Maladaptive Behaviour domain scores are also presented.*

*EKT*

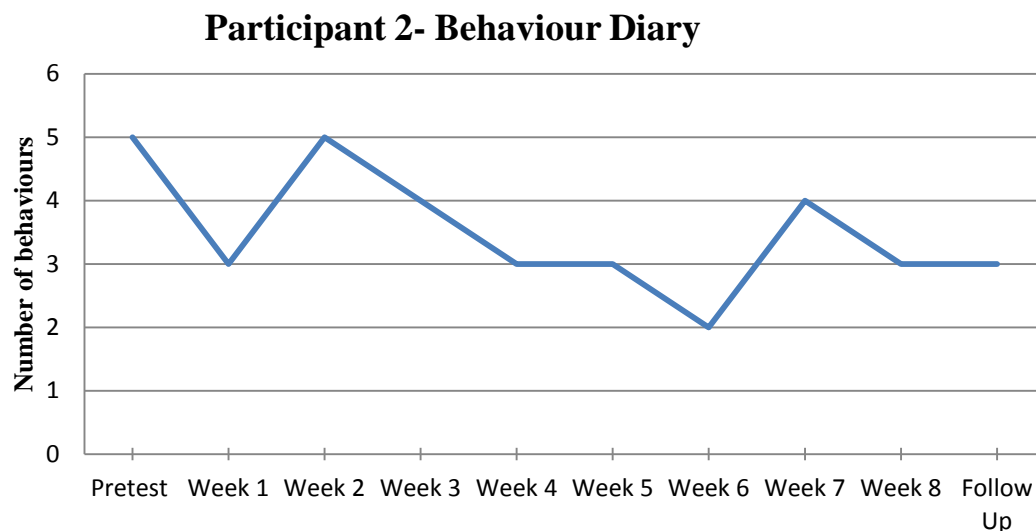
Figure 5 shows that Jane’s overall score on the EKT improved from 58% at baseline to 79% at Week 7. At follow up Jane’s overall score was 66% which was a small improvement from her baseline score. Jane’s performance improved more on the sentence-labelling task than on the photograph-labelling task.



**Figure 5:** Jane’s EKT Scores

## Behaviour Diary

Over the intervention period, the number of problem behaviours decreased from 5 a week to 3 a week. Due to the low occurrence of these behaviour problems, it is hard to say whether there has been an improvement in Jane's behaviour. Jane's behaviour diary can be seen displayed in Figure 6.



**Figure 6:** Jane's Behaviour Diary

## Discussion

Jane's score on the Socialisation domain was very low at baseline, indicating that this is an area of difficulty for her. Similar to Participant 1, Jane has a diagnosis of autism which may account for this difficulty. Jane's mother reports that Jane does not really have friends and that she prefers to be alone and take part in solitary activities. At follow up, Jane's scores on all three of the Socialisation subdomains improved slightly. Looking at the individual items that Jane scored more highly on at follow up, it seems that the areas in which she has made improvements are those which require an understanding of others emotions, or which require Jane to regulate her own emotions. For example, Jane's mother reported at baseline that Jane would never use actions to show happiness for others, at follow up it was reported that Jane would usually do so. Moreover, it was reported at baseline that Jane would sometimes be able to control her anger or hurt feelings when plans change for uncontrollable

reasons, at follow-up, it was reported that Jane would usually be able to do this. Although this is interesting information, it should be noted that these are only minor improvements that were unable to be quantified and were only on one measure.

Jane's scores on the EKT improved from baseline to follow up, particularly on the sentence-labelling task. This could also suggest that Jane had developed a deeper understanding of people's emotions in social situations. If this was the case, it could be expected that other social skills, such as the ones measured by the Vineland-II would improve as well. As discussed before, small improvements were made, however these improvements were not significant enough to draw any major conclusions from.

Jane's behaviour diary shows that throughout the intervention, there was a small decrease in the number of occurrences of the identified problem behaviours; however the behaviours were not occurring regularly enough to say whether this had been much of an improvement. Moreover, Jane's score on the Maladaptive Behaviour domain did not change from baseline to follow up. Considering these findings, it is difficult to say whether the intervention had an effect on Jane's behaviour.

## **Participant 3**

### **Participant Information**

#### *General*

Participant 3 (pseudonym Hemi) is a 12 year old boy, who lives in foster care with his foster parents, their two children and another foster child. Hemi has severe ADHD, a Specific Learning Disorder (SLD) and oppositional behaviours; he attends a specialised high school for children with special needs.

### *Communication*

Hemi's score on the receptive language measure (PPVT-IV) was at the 8<sup>th</sup> percentile, yet his score on the Communication subdomain of the Vineland- II was at the 1<sup>st</sup> percentile.

### *Behaviour*

Hemi's caregiver reports that his problem behaviours mainly involve delays in responding to requests made by his caregiver or teachers, and oppositional behaviours such as arguing and becoming aggressive, sometimes physically, when things are not going his way.

## **Results**

### *Intervention*

Hemi participated in 16 intervention sessions over 8 weeks. There was a two week break between Week 3 and Week 4 due to the Christmas-New Year period. There are no missing data.

### *Vineland-II*

Hemi's score on the Socialisation domain of the Vineland-II was within the 5<sup>th</sup> percentile at baseline, this score had not changed at follow up. Taking a closer look at his scores, Hemi's score on the Play and Leisure Time subdomain and on the Coping Skills subdomain had both improved slightly at the follow up session, however Hemi's score on the Interpersonal Relationships subdomain had decreased slightly, making it so that there was no improvement in his overall Socialisation score. Hemi's score was in the 'clinically significant' range on the Maladaptive behaviour domain at baseline, this score had decreased enough to be classified as 'elevated' by the follow up session. This improvement was made on the internalising subdomain, there was no change on the externalising behaviour subdomain.

**Table 6**

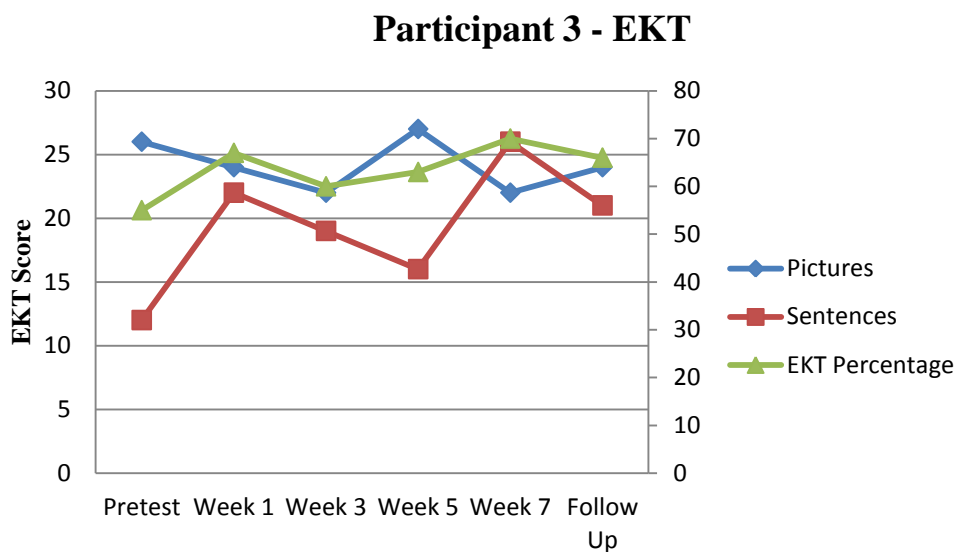
Hemi's Baseline and Follow Up Measures

PPVT-II	Vineland Communication	Vineland Socialisation		Vineland Maladaptive Behaviour	
		Baseline	Follow Up	Baseline	Follow Up
137 (8 <sup>th</sup> percentile)	67 (1 <sup>st</sup> percentile)	76 (5 <sup>th</sup> percentile)	76 (5 <sup>th</sup> percentile)	21 (clinically significant)	20 (elevated)

*For each measure the standard scores are presented, along with percentile scores for the PPVT-IV and the Communication and Socialisation domains of the Vineland-II. The ranges for the Maladaptive Behaviour domain scores are also presented.*

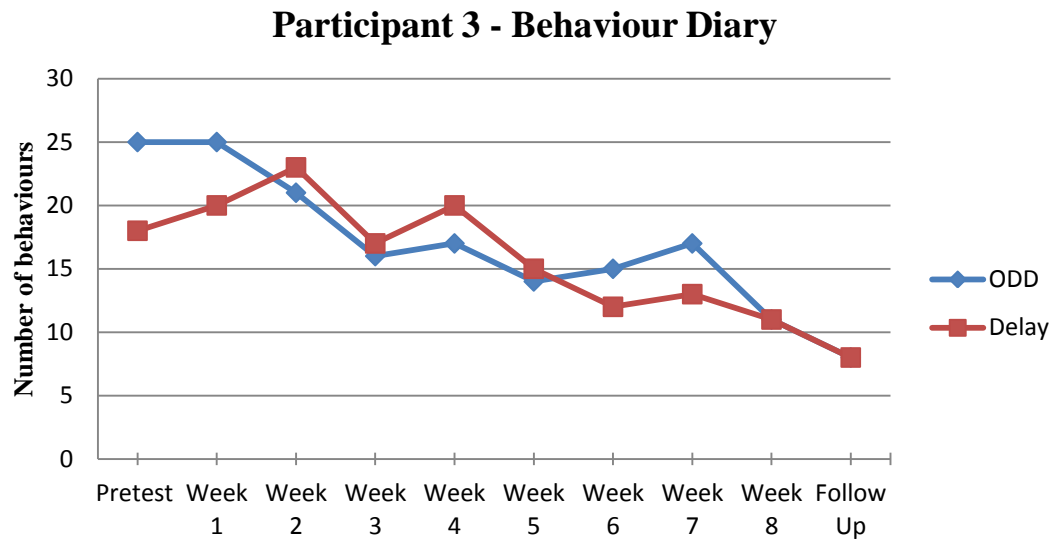
### EKT

Hemi's overall score on the EKT improved from 55% to 70% over the intervention phase, and was 66% at follow up. There was no improvement made on the photograph labelling task, however Hemi doubled his score on the sentence-labelling task. Hemi's EKT scores can be seen displayed on Figure 7.



**Figure 7:** Hemi's EKT Scores





**Figure 8:** Hemi's Behaviour Diary

#### *Behaviour Diary*

The number of occurrences of both of Hemi's target problem behaviours decreased throughout the intervention and had both reduced by more than 50% by the follow up session. The results of Hemi's behaviour diary can be seen displayed in Figure 8.

#### *Caregiver Observations*

Along with Hemi's oppositional behaviours decreasing throughout the intervention, Hemi's caregiver had also noticed a change in the way he could talk to Hemi when he had misbehaved. Hemi would be more able to talk about the misbehaviour calmly with his caregiver after it had happened, his caregiver feels that this was due to Hemi being able to recognise that his caregiver was not angry with him at the time of the discussion, but just wanted to talk about it. Before, Hemi would assume that he was angry and would become defensive and sometimes aggressive.

### **Discussion**

Hemi's scores on the PPVT-II and on the Vineland-II Communication domain were both low. Whilst working with Hemi, the researcher observed that Hemi struggled with

reading and writing, however it was felt that Hemi's verbal communication was well developed and it was likely that Hemi would be able to engage with the intervention material.

Hemi's scores improved on the Play and Leisure Time and on the Coping Skills subdomains on the Vineland-II Socialisation domain; however his score on the interpersonal relationships subdomain decreased slightly. It would be reasonable to expect that if Hemi's emotion knowledge had improved in terms of recognising other's emotions in social situations, that other areas of social skills would have improved also, particularly interpersonal relationships as recognising others emotions is the building block to having successful interactions with that person (Denahm, 1998). However this was not the case. It is also interesting that Hemi's score on the sentence-labelling task of the EKT improved, and his caregiver reported that he felt he had seen improvements in Hemi's understanding of other's emotions, yet his score on the interpersonal relationships subdomain had not improved. It may be that improvements in Hemi's emotion knowledge is the first step, and that improvements in other areas of his life such as interpersonal relationships is likely to follow after some time of putting his new emotion knowledge skills into practice.

Hemi's score on the Maladaptive Behaviour domain decreased in terms of internalising behaviour problems, however there was no improvement made with externalising behaviours. This finding may be related to the fact that Hemi's score on the Coping Skills subdomain also improved which may suggest that Hemi's emotion knowledge has improved in terms of understanding his own emotions. It may also be that Hemi's externalising behaviour problems are not as related to his emotions as were his internalising ones, therefore are unlikely to improve as a result of increased emotion knowledge. This finding is in line with Fine et al's (2003) study which found a relationship between less developed emotion knowledge and the higher prevalence of internalising behaviour problems.

Hemi's score on the sentence-labelling task of the EKT improved throughout the intervention, yet his score on the photograph-labelling task did not. At the beginning of the intervention there was a big difference between Hemi's score on the photograph-labelling and sentence-labelling scores. Hemi's score on the photograph labelling task was relatively high to begin with, indicating that his ability to label emotions from facial expressions was well developed to begin with. This gap had disappeared by the end of the intervention which may indicate that over the intervention Hemi developed a deeper understanding of people's emotions in social situations.

The observations by Hemi's caregiver that Hemi was more able to discuss misbehaviours calmly are in line with this finding. It seems that Hemi was able to recognise that his caregiver was not angry and therefore was able to talk to him calmly.

It should be noted that there was a two week break for in the intervention between weeks three and four due to Christmas. There was a decrease in Hemi's score on the sentence labelling task of the EKT over this time, which may be explained by this break.

Over the course of the intervention, Hemi's score on the behaviour diary improved for both target behaviours which may indicate that Hemi's behaviour problems have improved since learning about emotions and social problem solving. However there are some important things to consider while interpreting these results. During the last two weeks of the intervention Hemi had started school again after the summer break, meaning that his caregiver was not with him for the whole day to record his behaviours. Although Hemi's caregiver did attempt to include reports of Hemi's behaviour from school into the diary using his daily school diary, it still may not have been an accurate record of his behaviour over that time. Secondly, at the beginning of the intervention period, Hemi had learnt that this biological father was sick and in hospital for some time. Hemi's caregiver reported that this may have had an effect on his behaviour and may explain why Hemi's behaviour scores were

as high as they were at the beginning. Lastly, Hemi's caregiver reported that the decrease in oppositional behaviours may have been related to the fact that Hemi was adjusting to living in this foster care placement and the boundaries that had been placed on his behaviour since living there. It may be that the decrease in the behaviours was a result of the adjustment process and less to do with the intervention itself. In saying this however, Hemi has been living with this foster family for two years.

Although there were improvements made for both target behaviours, Hemi's oppositional behaviour improved more so that his delays in following instructions. It may be that Hemi still finds following instructions difficult due to his SLD, as this is a common difficulty for children with this diagnosis (Lovitt, 1989).

## **CHAPTER 5**

### **GENERAL DISCUSSION**

This study set out to explore if the use of an adapted version of the PATHS programme with children and adolescents aged between 9 and 18, who have developmental disabilities, could improve both their emotion knowledge and their behaviour problems? The underlying rationale for the study was that children with developmental disabilities have been shown to display more behaviour problems than typically developing children (Roberts & Lawton 2001) and have difficulties with emotion knowledge (Wishart et al, 2007, Kasari et al 2001, Sinzig et al, 2008, Bal et al, 2010). As these two areas have shown to be related (Trentacosta & Fine, 2009, Fine et al, 2003, Cook et al, 1994, Denham et al, 2002, Kidwell et al, 2010), it was thought that an emotion knowledge intervention may support the reduction in behaviour problems observed in these children.

A single-subject design was used to investigate the research question with three participants. Participant 1's (Tom's) scores on the EKT improved throughout the

intervention, particularly on the sentence-labelling task and these improvements were maintained at follow up. Tom's problem behaviours decreased in frequency throughout the intervention as measured by the behaviour diary and Maladaptive Behaviour domain of the Vineland-II. Tom's mother also reported other changes such as Tom verbally indicating that he was using problem solving skills both at school and at home. Tom made improvements in the area of socialisation, particularly with interpersonal relationships as measured by the Vineland-II.

Participant 2's (Jane's) scores on the EKT also improved over the intervention, yet it is unclear whether the intervention had had an effect on her behaviour as the behaviour problems were not occurring regularly enough. Jane made small improvements with social skills, as measured by the Vineland-II, yet her score on the Maladaptive Behaviour Index did not change.

Participant 3's (Hemi's) scores on sentence-labelling task of the EKT improved throughout the intervention yet his score on the photograph-labelling task did not. Hemi's problem behaviours steadily decreased throughout the intervention as measured by the behaviour diary and his score on the Vineland-II Maladaptive Behaviour domain decreased for internalising behaviours. Hemi did not seem to make any improvements in the area of Socialisation as measured by the Vineland-II. Hemi's caregiver reports that he feels that Hemi has improved in his ability to understand other's emotions.

Interestingly all of the participants made improvements on the sentence-labelling task of the EKT, and maintained these improvements at the three week follow up. Improvements on the photograph-labelling task were small, if there at all. The material in the PATHS programme is delivered to children through the use of stories and activities based on children in social situations. It seems that the participant's emotion knowledge improved in that they

have developed their understanding of people's emotions in social situations. However, there has been no improvement made with recognition of facial expressions.

Denham (1998) suggests that children who have an understanding about other's emotions are likely to have positive relations with their peers. If it is the case that the participants in this study have developed their understanding of others' emotions, it would be likely that they have made improvements in the area of socialisation. This was the case with one participant, who made a gain of 2 years and 9 months with his interpersonal relationship skills, as measured by the Vineland-II. However this was not the case with the other participants who made only small improvements in this area. There are a number of possible explanations for this finding. It may be that these children do make an improvement in the area of socialisation, but that this improvement comes later, after their newly acquired emotion skills have been practiced for some time. It may be that improvements in socialisation have been made, but the measure used to record this improvement (Vineland-II) was not appropriate or sensitive enough to capture the change. It seems that this may be likely, as the parents and caregivers have reported positive changes in their children such as talking to them about their problems, less 'acting out' and using positive solutions in the face of problems with peers and siblings. One more possibility is that the parents are reporting positive changes that are not realistic.

Tom and Hemi's behaviour problems decreased throughout the intervention, and both participants' scores on the Maladaptive Behaviour domain of the Vineland-II improved. This finding, along with the fact that both boys improved on the sentence-labelling task of the EKT, may be indicative that improvements in emotion knowledge can lead to improvements in behaviour problems. This would support the research by Trentacosta and Fine (2009) and Fine et al (2002) who have found that emotion knowledge and behaviour problems are

related.

### *Clinical Implications*

The findings from this study are in line with those found by Kam et al (2004) and Greenberg and Kusche (1998), who have used the PATHS programme with children with various disabilities and found positive results in regards to teacher-reported internalising and externalising behaviour problems and in children's social problem-solving skills, emotional recognition skills, and teacher- and parent-rated social competence. These studies used longer-term, in-school group programmes, whereas this study was shorter and used a one-to-one format. Therefore this research also adds to the literature in that it provides evidence of the possibility of using the PATHS programme as a shorter duration, one-to-one intervention. Replications of the current study would further support the results.

### *Limitations*

This study presents with several limitations. For example, as with all single subject research, it cannot be known whether the results of the study generalise to the larger population of children with developmental disabilities. One way to overcome this issue would be to conduct replications of the study with participants who have similar characteristics to those in this study (Cakiroglu, 2012).

The intervention sessions took place at home for most of the participants (except for Participant 2 who received four sessions at school), which could mean that the skills learnt may not generalise from the home to the school setting. Also, the behaviour diary was solely completed by the participant's parent or caregiver; it may have been worthwhile collecting information from the teacher to see if generalisation across settings was occurring. Using a more reliable measure of behaviour, such as the Achenbach Child Behaviour Checklist with multiple informants, or direct observations of behaviour would complement the information

collected from the behaviour diary and would have increased the validity of the data obtained.

The length of the intervention was also not ideal. The PATHS programme contains a lot of useful information and the intervention was only eight weeks long with two sessions a week, therefore there was not much time spent on each topic. It may have been beneficial for the children to have spent more time on each topic to promote further understanding of the material. Moreover, due to time constraints, the baseline period consisted of only one week for most participants. It would have been ideal to have a longer baseline period, in order to collect more reliable data of how things were before the introduction of the intervention.

The measures used in this particular study did not capture all the changes that were made throughout the intervention particularly well. The Vineland-II was useful as an indicator of the level of a child's social skills and behaviour problems, however the measure was not sensitive enough to measure the improvements that were made over the intervention period. The measures used by Bauminger (2002) are a good example of which measures could have been used in the current study to evaluate the effects of the intervention. The Problem Solving Measure (PSM, adapted from Lochman and Lampron, 1986) was used to measure changes in social cognition. The PSM involves giving children theoretical social problem stories which have only a beginning and an end, and asking the children to compose the body of the stories. The children's responses are scored according to five criteria: activity, relevance, number of solutions, variety, and content. Using the PSM or a similar problem solving measure in this study would have complemented the EKT in measuring changes in emotion knowledge and social problem solving. Bauminger (2002) also used an observation schedule to measure changes in the nature and number of social interactions the children participated in at school before and after intervention. Moreover, the Social Skills Rating Scale (SSRS-T; Gresham and Elliot, 1990, cited in Bauminger, 2002) was used which asks



teachers to rate their students' overall social skills on a three point scale. The social skills looked at include cooperation, assertion and self control. Measures such as these would have complemented the Vineland-II in measuring the effects of the intervention on the children's social skills.

Two participants' target behaviour problems decreased throughout the intervention, yet it is hard to tell which component of the intervention led to this improvement in behaviour. It may be that the participant's increased understanding of other's emotions in social situations (as shown by increasing scores on the EKT sentence-labelling task) was a factor in the reduction of problem behaviour. However a large proportion of the intervention was focused on social problem solving. It may be that learning this skill is what led to the decrease in problem behaviour in both boys. The use of more specific measures such as a social problem solving measure and a social skills measure may have made it clearer as to which parts of the intervention lead to more of a decrease in problem behaviour, whether it was learning about emotion knowledge, or social problem solving.

#### *Future Research Directions*

The Emotion Knowledge Test was designed specifically for this study and was based on measures used by other researchers (Michalson & Lewis, 1975, Morgan et al, 2010). It seems as if the procedures used in the EKT are a popular way to measure emotion knowledge in children. Further development of the EKT may be useful for future researchers in the field. This may include a larger pilot study to verify the photographs and sentences used, collecting data from a large sample of children of different ages and devising aged-based norms.

The PATHS programme has been designed to be used by teachers in classrooms. The children in this study may have missed out on some social and incidental learning opportunities by receiving one-to-one sessions. A group based study may be more useful for

these children where they are likely to make friends, practice their new skills and learn from one another. Moreover, a study that recruited a larger group of participants would be beneficial, and would add to the limited research around emotion knowledge and behaviour problem interventions for children with developmental disabilities. Increasing the length of the intervention may also be useful, so children can spend a longer amount of time learning each of the topics within the PATHS programme.

### *Conclusion*

Although each participant made improvements in terms of emotion knowledge and behaviour problems, overall these improvements were small. It also cannot be said with great certainty that these improvements were due to the emotion knowledge intervention. Therefore the results discussed should be interpreted with caution.

The PATHS programme includes many useful concepts and tools when working with children with developmental disabilities. The programme is easy to use as it comes with a comprehensive lesson by lesson plan and was easily adaptable to use in a one on one situation and with children with low language ability.

Although concrete conclusions cannot be made about the effectiveness of the PATHS programme in improving emotion knowledge and behaviour problems, the children involved in this particular study seemed to engage with the material in the programme most of the time, and made improvements in their emotion knowledge and in some instances, behaviour problems. It also seems that these children made other improvements throughout the intervention period that were not captured by the measurements used in this study. Moreover, although this research does come with a number of limitations, it would still appear that there is promise for the use of the PATHS programme with children with developmental disabilities in terms improving emotion knowledge and behaviour problems. More research is

needed in the form of replications of this study, and also in the form of larger, group-based studies.

Research into the link between emotion knowledge and behaviour problems in children with disabilities, plus interventions to target both of these areas, seems an area of research that is lacking. However, this seems to be an area of work that would benefit these children greatly, with the possibility of it leading to better social and academic outcomes.

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9<sup>th</sup> November 2011

Child and Family Psychology Programme  
Health Sciences Centre

**An Emotion Knowledge Intervention for Children with Developmental Disabilities**  
**Information Sheet for Parents**

Dear Parent,

My name is Aimee Randall, I am currently studying at University of Canterbury, working on my Masters in Child and Family Psychology and working on becoming a registered psychologist. Part of my course requirements is that I complete a Master's Thesis, a research project. I would like to invite you and your child to participate in this project.

**About the Study**

My study focuses on children with developmental disabilities and with behaviour problems that are thought to stem from difficulties in communicating about or understanding their emotions. The study will introduce the child to an emotion knowledge programme, which aims to teach skills such as recognising emotions in themselves and others, communicating about emotions and some strategies for how to deal with more uncomfortable emotions. I will be looking to see if this programme improves the children's emotion knowledge and to see whether the children's behaviour problems improve.

**Your participation in this study**

This will involve an initial meeting with myself, which your child will attend also, during which we will discuss your child's participation in the study, and any behaviour problems that your child has that possibly stem from their emotions. Your child will be asked to participate in a standardised procedure that measures their language ability, and then one that measures their emotion knowledge. These tests both involve looking at pictures and listening to short stories, they will take approximately 30 minutes to do and should not be distressing at all for your child. In the case that your child has a score on the language ability test that is very low, a decision will have to be made as to whether participation is suitable for your child. If the decision is made that the child's language ability is not at a level where they are able to benefit from the intervention, then I will discuss with you and your family any concerns you may have about your child's behaviour and communication about emotions, and whether the services that you are currently involved with are able to support you with these concerns.

The emotion knowledge programme will run for 10 weeks, during which I will come to your house, or a location that is suitable to you, twice a week and work with your child for up to an hour each session, that is 20 sessions in total. These sessions will be scheduled for a time that suits you and your family and will be discussed during the second meeting. I will ask you to complete a behaviour diary during these 10 weeks which requires that you record each instances of the identified behaviour problems, along with details such as where and when it happened, what happened before and after the behaviour etc. Your child will be asked to complete the same emotion knowledge assessment every two weeks so that I can see if improvements are being made.

The material covered in the programme is not designed to be at all distressing for your child. However discussions of the more uncomfortable emotions such as sad or angry may evoke some distressing feelings in some children. The programme teaches ways to manage these feelings so your child will be encouraged to use these new skills being learnt. Discussion of feelings will always be done in a sensitive way that is comfortable and safe for your child. It is asked that you attend the sessions with your child, not only so that you can observe and possibly participate in the programme, but also in the case that your child does find discussing these hard times too distressing.

There may be a follow up, which will involve one more meeting about 3 weeks after the programme has finished, where your child will do one more emotion knowledge test and we will talk about how things have been going since the programme finished.

Participation in this study is completely voluntary, and you will be welcome to withdraw at any stage if you wish, in which case any information gathered from you and your child will be destroyed and will not be used in the study.

### **What will happen to your information?**

During the entirety of the project, all information collected from you and your child will be kept confidential. All of the information will be kept in a locked location in the Health Sciences Department of the University. Your information will also remain anonymous, for example, I will not use your names anywhere in the project, and instead you will be given different names to protect your identity. The only people to view the original information will be me and my supervisors, Dr Dean Sutherland and Dr Karyn France.

This study has been reviewed and approved by the University of Canterbury Human Ethics Committee, there is no known risk to the child from these procedures and assessments and all interactions with your child will be done so in a child-friendly and sensitive manner.

The results of the study will be reported in my final write up of the study, which at this stage will only be used for university purposes. If there are any changes to the plans for publication, for example if the study will be used for any other purpose, I will consult you first.

You will be most welcome to receive a copy of the final project, just let me know and I can give a copy to you once it has been printed.

If at any stage you have questions about the study, or you are willing to participate, feel free to contact me using the contact details at the bottom of this page. Alternatively, you can contact my primary supervisor at the university who is helping me with this study Dr Dean Sutherland, his contact details are included at the bottom of this letter.

I would like to thank you for your interest in my study and for taking the time to read this information.

Aimee Randall

My contact details are:

Phone number: 0272213706

Email: [alr42@uclive.ac.nz](mailto:alr42@uclive.ac.nz)

Dr Dean Sutherland:

Email: [dean.sutherland@canterbury.ac.nz](mailto:dean.sutherland@canterbury.ac.nz)

Phone number: +64 3 364 2987 ext. 7176

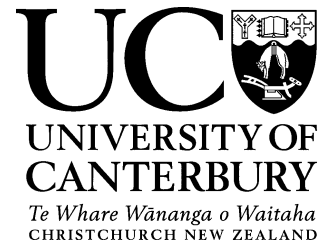
Appendix B: Consent Form for Parents

## Appendix B: Consent Form for Parents

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9<sup>th</sup> November 2011



Child and Family Psychology Programme

Health Sciences Centre

### **An Emotion Knowledge Intervention for Children with Developmental Disabilities**

#### **Consent Form for Parents**

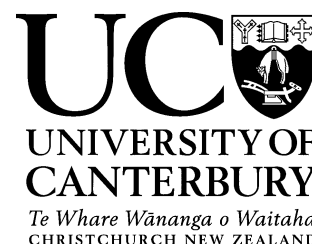
- I/we have read and understood the attached information sheet, and I/we have been given the opportunity to ask questions.
- I/we understand what my/our involvement in the study will be.
- I/we understand that participation in this study is voluntary and that I/we can withdraw at any time without penalty.
- I/we understand that if it is decided that participation in the study is not suitable for my child, the researcher will discuss with me ways to get support for my concerns through the agencies/services I am involved in.
- I/we will commit to keeping accurate records throughout the study
- I/we understand that any information provided is kept confidential to the researcher and their supervisor and that any published reports will not identify me/us. I/we understand that all data will be kept in a locked and secure cabinet and will be destroyed after the completion of the study.
- I/we understand that the data will be included in a Master's Thesis which is a public document accessible through the UC library and may also be used in conference and journal publications.
- I/we understand that I am/we are able to receive a copy of the report and have been given instructions on how to do so.
- I/we understand that I/we can contact the researcher or their supervisor if we have any questions at any stage throughout the study.

Signed \_\_\_\_\_

Relationship to participant \_\_\_\_\_

Date \_\_\_\_\_

9<sup>th</sup> November 2011



Child and Family Psychology Programme

Health Sciences Centre

**An Emotion Knowledge Intervention for Children with Developmental Disabilities**

**Information Sheet for Children**

Dear ,

My name is Aimee Randall, I go to University of Canterbury, where I am learning to work with children and families. I am learning to help them with problems or things that they find difficult. For my course I have to do a research project, I would like for you and your parent/caregiver to be part of this.

My study focuses on children with developmental disabilities who have difficulties with communication and behaviour. During the study you will be meeting with me twice a week for 10 weeks to learn about emotions. We will be doing fun activities, reading stories and talking about emotions. I want to see if this helps you to understand emotions a little bit better.

As well as seeing me twice a week, your parent/caregiver will be keeping track of your behaviour, and writing down times that you might find a little difficult to deal with. You can do this too if you like. I would like to see if learning about emotions can help you deal with these tough times better, and hopefully help you to communicate about how you are feeling.

I will ask you do a couple of activities before, during and after the study, but these won't be like things you do at school, they will be a bit more fun and will give me an idea of your knowledge about feelings.

At any stage if you do not want to be in the study anymore, that is ok, you can just let me know and you will not be asked to do anything more.

Everything we do and talk about will be confidential, which means no one else will see it or hear about it apart from me, my teacher and your parent/caregiver. The only time I can talk to anyone else is if I am concerned that someone might be unsafe. In that case I would talk to you first if that was possible.

If you understand the information on this page and would like to take part in this study please write your name and signature at the bottom of the page.

Name \_\_\_\_\_ Signature \_\_\_\_\_

Date \_\_\_\_\_

## Appendix D: Semi-structured Interview Questions

### **General:**

Tell me about your child, what made you decide to take part in this study?

### **Behaviour**

Tell me about his/her behaviour? What happens?

How do you make sense of your child behaving in this way?

(If emotions not mentioned) How do you think he/she is feeling when he/she behaves like that?

How long has this behaviour problem been happening? Can you give me a couple of examples?

When does this behaviour happen normally? What is happening leading up to the problem behaviour?

What happens after the problem behaviour? How is the situation resolved?

### **Development**

Now I am going to ask about other aspects of your child's development.

How is he/she getting on at school/centre? What is a typical day like?

What are his/her strengths? Any things that he/she particularly enjoys?

What about challenges? Social? Educational? Other?

Do you have any other worries or concerns about your child? In the family?

## Appendix E: Behaviour Diary

### BEHAVIOUR DIARY

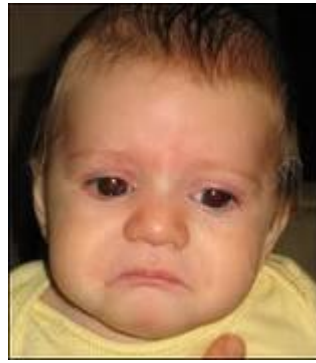
Date	Behaviour	Frequency (tally)	Other comments
Monday	1.		
	2.		
Tuesday	1.		
	2.		
Wednesday	1.		
	2.		
Thursday	1.		
	2.		
Friday	1.		
	2.		
Saturday	1.		
	2.		
Sunday	1.		
	2.		
Total	1.		
	2.		



Appendix F: Examples of photographs and sentences used in the EKT



Happy



Sad



Angry



Scared

Happy: Natalie's netball team just won their game

Disgusted: Harry takes a big gulp of milk and then finds out that it has actually gone off!

Surprised: Rachel has just found out that she has won \$100 as first prize in the school raffle

Excited: Molly's family are going on holiday to the Gold Coast in the morning